

**ABSTRACT**

The oscillating unit 11 generates a signal having a frequency of  $n \cdot f$ , i.e.,  $n$  times a target frequency  $f$ . The control voltage generation circuit 21 compares the phase difference between a divided signal of a signal generated in the oscillating unit 11 and the reference signal, and outputs a DC control voltage according to the phase difference to the oscillating unit 11, thereby controlling an oscillation frequency. The divider circuit 22 converts a signal generated in the oscillating unit 11 to the target frequency  $f$ , by dividing the aforementioned signal into  $n$  equal units. By setting the oscillation frequency of the oscillating unit at  $n$  times the target frequency, the inductance and the capacitors can be formed on a semiconductor integrated circuit board.